Remarks

Claims 1-29 are pending.

The specification at the paragraph on page 4, line 27 through page 5, line 6, has been amended (page 4, line 27) to recite the "trip unit 9" of Figure 1.

The specification at the paragraph on page 7, line 21 through page 8, line 12, has been amended (page 8, line 4) to recite the "resistor 56" of Figure 4.

Claim 16 has been rewritten in independent form to recite the limitations of Claim 1.

Claim 21 has been rewritten in independent form to recite the limitations of Claim 18.

Claim 26 was amended to remove unintended text from the claim recital.

Claims 27, 28 and 29 were added. See, for example, original Claims 18, 4 and 19, respectively.

A Fee Sheet and duplicate copy thereof accompany this Amendment.

OBJECTIONS TO SPECIFICATION

The Examiner objects to the specification on the ground of two informalities regarding the trip unit 9 and the resistor 56.

The specification at page 4, line 27 has been amended to recite the trip unit 9 of Figure 1. The specification at page 8, line 4 has been amended to recite the resistor 56 of Figure 4.

Therefore, it is submitted that the objections to the specification have been dealt with.

REJECTIONS UNDER 35 U.S.C. § 103(a)

The Examiner rejects Claims 1-12, 14, 15, 17-20 and 26 on the ground of being unpatentable over U.S. Patent No. 4,866,557 (Fitts et al.) in view of U.S. Patent Application Publication No. 2003/0231440 (Papallo et al.).

Fitts et al. discloses a programmable logic control device 2 which controls or commands a control device, such as a trip device 4. The trip device 4 trips a circuit breaker 5 in the case of abnormal conditions in the electrical conductor 6 of an electrical power system (not shown). A control panel 30 of the programmable logic control device 2 includes an adjustable Instantaneous Pick-up Control Knob 32, adjustable Short Time Control Knob 34, an adjustable Long Time Control Knob 36 and an adjustable Ground Pick-up Control Knob 38. Also, a Short Time Delay knob 42 may be adjusted so as to select a minimum, intermediate or maximum setting which corresponds to selected time settings of time delay

circuits 18. A Long Time Delay Control Knob 44 may be adjusted so as to select a minimum, intermediate or maximum setting which corresponds to selected time settings of the time delay circuits 18. A Ground Delay Control Knob 46 may be adjusted so as to select a minimum, intermediate or maximum time delay setting which corresponds to selected time setting intervals of the time delay circuits 18. The programmable logic control device 2 allows the user to quickly select the desired control parameter of instantaneous time, short time, long time and ground faults and to change such parameters by adjusting the Control Knobs as well as the ampere-taps. The programmable logic control device 2 also includes an I^2T On-Off switch 40 so as to enable the user to switch into or out of the time current characteristics of I^2T illustrated in Figure 14.

The Examiner admits that Fitts et al. does not disclose a method for providing protection against arc flash during maintenance.

The Examiner takes the position that Papallo et al. (Paragraph 80) discloses that "minimizing the time delay of circuit breaker (415)" is desirable in order to reduce arc energy exposure of operating and service personnel "during maintenance". This statement is respectfully traversed in view of the express disclosure of Papallo et al..

It is respectfully submitted that Papallo et al. does not teach or suggest any "minimizing the time delay of circuit breaker (415)" as stated by the Examiner. As will be explained in detail, below, in complete contrast to the Examiner's position, Papallo et al. expressly teaches additional delay (delaying the opening of main-1 CB 415; providing minimal additional delay) based upon a modified dynamic delay time. Furthermore, Papallo et al. does not teach or suggest, and adds nothing to Fitts et al. regarding providing protection against arc flash "during maintenance". Hence, Papallo et al. does not teach or suggest, and adds nothing to Fitts et al. regarding any "maintenance trip function" or any "maintenance means" as contemplated by the refined recital of the claims of the present Application.

Papallo et al. discloses (Paragraph 77) in connection with Figure 5 that the modified dynamic delay time for main-1 CB 415 is determined from the sum of the pre-defined delay time and the clearing time of feeder 1 CB 420. The pre-defined delay time is set to best service load 431. The clearing time of a circuit breaker, such as feeder 1 CB 420, is dependent on the type of circuit breaker. The delay time for opening of main-1 CB 415 is then modified based upon the value determined by CCPU 28, as schematically represented by reference numeral 475. This allows feeder 1 CB 420 the optimal time for feeder 1 CB 420 to clear the fault X before main-1 CB 415 opens. The modified dynamic delay time determined by ZSI routine 426 reduces potential damage to system 105. In particular (emphasis added):

> The modified dynamic delay time also increases the efficiency of system 105 by delaying the opening of main-1 CB 415 for the optimal time period to provide the downstream circuit breaker, feeder 1 CB 420, with the full opportunity to clear the fault X so that other loads, i.e., load 432, can still receive power.

The portion of Papallo et al. relied upon by the Examiner reinforces this view. Paragraph 80 of Papallo et al. (Figures 4-7) (emphasis added) states that:

> CCPU 28 coordinates protection system 26 by causing the circuit breaker 14 nearest to the fault to clear the fault. Protection system 26 variably adjusts the dynamic delay time for opening of the upstream circuit breakers 14 to provide backup protection for the downstream circuit breaker nearest the fault. In the event that the downstream circuit breaker 14 nearest the fault is unable to clear the fault, the next upstream circuit breaker will attempt to clear the fault with minimal additional delay based upon its modified dynamic delay time. As shown in FIG. 7, when a fault occurs between a main circuit breaker and a feeder circuit breaker, e.g., main-1 CB 415 and feeder 1 CB 420, the minimal delay of the main-1 CB opening reduces the let-thru energy. This reduces system stress, damage and potential arc energy exposure of operating and service personnel while maintaining selectivity. In an exemplary embodiment, protection system 26 and CCPU 28 allow the implementation of ZSI routine 426 to modify the dynamic delay times for opening of any circuit breakers 14 throughout system 105 without the need for additional wiring coupling each of the circuit breakers to one another. CCPU 28 provides an open command to the upstream circuit breakers 14 for opening at dynamic delay times as determined by ZSI routine 426.

In other words, Papallo et al. teaches that main-1 CB 415 employs one delay when it trips to clear the fault (above Main Bus in Figure 7) and employs "additional delay" before main-1 CB 415 trips to clear another fault (below Feeder 2 CB 425 in Figure 6) that should, otherwise, normally be cleared by Feeder 2 CB 425.

Claim 1 recites, *inter* alia, a method of providing protection against arc flash during maintenance on a low voltage power circuit including a circuit breaker having a specified trip function for responding to a fault comprising: overriding the specified trip function with a maintenance trip function that results in reduced arc energy in the fault during a trip over arc energy during a trip with the specified trip function; and restoring the specified trip function following maintenance.

Fitts et al. does not teach or suggest a method for providing protection against arc flash during maintenance.

Papallo et al., which expressly teaches that main-1 CB 415 employs one delay when it trips to clear a fault (above Main Bus in Figure 7) and employs "additional delay" before main-1 CB 415 trips to clear another fault (below Feeder 2 CB 425 in Figure 6), clearly does not teach or suggest and, in fact, teaches away from overriding a specified trip function with a ***maintenance*** trip function that results in ***reduced*** arc energy in a fault during a trip over arc energy during a trip with such specified trip function.

As to the "the minimal delay of the main-1 CB opening reduc[ing] the let-thru energy" from Papallo et al. (¶80, col. 7), the express teaching of Papallo et al. is that the next upstream circuit breaker will attempt to clear the fault with minimal additional delay based upon its modified dynamic delay time. If anything, this teaches and suggests increasing arc energy in a fault during a trip over arc energy during a trip with a specified trip function. This is because the protection system 26 of Papallo et al. causes the circuit breaker 14 nearest to the fault to attempt to clear the fault and, thus, increases the delay time for opening of the upstream circuit breaker 14 to provide backup protection (at a later time) for the downstream circuit breaker nearest the fault.

Hence, for the above reasons, Claim 1 patentably distinguishes over the cited references.

It is submitted that another reason why Claim 1 is patentable over the references is that the method reduces the likelihood that maintenance personnel might be seriously injured or killed from an arc flash. For example, U.S. Patent No. 6,777,627 (Stevenson), which was cited by the Examiner, states (col. 1, ll. 16-19; col. 2, ll. 7-9) that "[i]t is well known in the power distribution industry that personnel who work on or near energized electrical equipment can be seriously injured or killed as a result of arcing faults" and that a "worker [being] well within the arc-flash danger zone ... could be seriously injured or killed in the event of an arc fault." Also, U.S. Patent No. 5,933,308 (Garzon), which was also cited by the Examiner, states (col. 1, ll. 34-37) that the "ionized gas associated with arcing faults may be released at pressures and temperatures sufficient to severely damage or destroy the switchgear equipment and/or cause severe burning injuries or death to operating personnel." Hence, it is respectfully submitted, *arguendo,* that if Applicants' invention was obvious, then in view of the very real and substantial desire to avoid serious or severe injury or death, surely someone would have disclosed Applicants' invention. This is not the case since no reference of record, whether taken alone or in combination, teaches or suggests Applicants' invention.

Therefore, for the above additional reasons, Claim 1 patentably distinguishes over the cited references.

Claims 2-12, 14, 15 and 17 depend directly or indirectly from Claim 1, include all of the limitations thereof, including, but not limited to, overriding the specified trip function with a maintenance trip function and restoring the specified trip function following maintenance, and patentably distinguish over the references for at least the same reasons.

Claims 2-11 and 14 recite refinements of "overriding the specified trip function" of Claim 1. Since the references do not teach or suggest the refined recital of Claim 1, they clearly do not teach or suggest these additional limitations which further distinguish over the references.

Furthermore, Claim 11 recites that overriding the specified trip function with a maintenance trip function comprises selecting one of a first maintenance trip function that results in a first level of arc energy in the fault during a trip that is less than the arc energy resulting from the specified trip function, and a second maintenance trip function that results in a second level of arc energy in the fault that is more than the first level of arc energy but less than the arc energy resulting from the specified trip function. Again, Fitts et al. does not teach or suggest any method for providing protection against arc flash during maintenance. Papallo et al., which expressly teaches that main-1 CB 415 employs one delay when it trips to clear a fault (above Main Bus in Figure 7) and employs "additional delay" before main-1 CB 415 trips to clear another fault (below Feeder 2 CB 425 in Figure 6), clearly does not teach or suggest and, in fact, teaches away from this refined recital. Since the references do not teach any arc flash maintenance trip function, they clearly do not teach or suggest a second maintenance trip function that results in a second level of arc energy in a fault that is more than a first level of arc energy but less than the arc energy resulting from a specified trip function. Hence, Claim 11 further patentably distinguishes over the references.

Furthermore, Claim 12 recites that the low voltage circuit is multiphase and that the maintenance trip function also causes a trip in response to a current imbalance in the multiple phases. Fitts et al. does not teach or suggest any method for providing protection against arc flash during maintenance, much less any ***reduced*** arc energy ***maintenance trip function***. Papallo et al., which expressly teaches that main-1 CB 415 employs one delay when it trips to clear a fault (above Main Bus in Figure 7) and employs "additional delay" before main-1 CB 415 trips to clear another fault (below Feeder 2 CB 425 in Figure 6), clearly does not teach or suggest and, in fact, teaches away from the recited maintenance trip function of Claim 1 that results in reduced arc energy in a fault during a trip over arc energy

during a trip with a specified trip function. Since the references do not teach any reduced arc energy maintenance trip function, they clearly do not teach or suggest a maintenance trip function that also causes a trip in response to a current imbalance in multiple phases. Therefore, Claim 12 further patentably distinguishes over the references.

Furthermore, Claim 14 recites that the specified trip function incorporates a jumpered zone interlock providing a specified delay and overriding the specified trip function comprises eliminating the specified delay. Fitts et al. does not teach or suggest any method for providing protection against arc flash during maintenance, much less any overriding a specified trip function with a ***reduced*** arc energy ***maintenance trip function***. Papallo et al., which expressly teaches that main-1 CB 415 employs one delay when it trips to clear a fault (above Main Bus in Figure 7) and employs "additional delay" before main-1 CB 415 trips to clear another fault (below Feeder 2 CB 425 in Figure 6), clearly does not teach or suggest and, in fact, teaches away from the recited overriding a specified trip function comprising ***eliminating*** such specified delay. To the extent that Papallo et al. might teach or suggest "adjusting adjustment knobs," although this is not admitted within the context of the present claims, any such hypothetical "adjusting" would clear involve adjusting to provide additional delay, which teaches away from eliminating a specified delay. Accordingly, Claim 14 further patentably distinguishes over the references.

Furthermore, Claim 15 recites that the recited eliminating the specified delay comprises ***open circuiting*** the jumpered zone interlock.[1] An example of this recital is set forth in the present Application at page 9, lines 2-10:

> For ease of manufacture, the zone interlock connections are provided on all of the breakers of the type such as 3'. Should a customer not care to implement zone interlocking, a jumper 65 is connected across the terminal 61, 63 to activate the short time delay in the trip unit 9 of the circuit breaker 3'. In accordance with this aspect of the invention, the maintenance switch 13" has contacts 67 which interrupt the interlock circuit to eliminate the time delay thereby producing a maintenance trip function that responds without delay to reduce arc energy should a fault occur during maintenance. When maintenance has been completed, the maintenance switch 13" is returned to the closed position to reinstitute the time delay, or the interlock function.

[1] To the extent that the Examiner bases this rejection on the rejection of Claim 14 (see the language "as mentioned above" on page 8, lines 2-3 of the Office Action), then this rejection is traversed for at least the same reasons. Otherwise, it appears that the Examiner bases this rejection on some other (unspecified) evidence, since it is not apparent that the Examiner cites any portion of the references for the rejection of Claim 15. Thus, it respectfully appears that the Examiner reaches this conclusion by the use of Applicants' disclosure which is clearly improper.

Claim 15 depends from Claim 14 and patentably distinguishes over the references, which do not teach or suggest "eliminating the specified delay" within the context of the claims (or any "reduced time delay" as was stated by the Examiner), for at least the same reasons. Furthermore, it is respectfully submitted that the Examiner presents no evidence to support the conclusion in the last sentence of the first paragraph of page 8 of the Office Action that the "tripping of the circuit breaker would result in open circuiting the jumpered zone interlock." It is respectfully submitted that the Examiner reaches this conclusion by the use of Applicants' disclosure which is clearly improper. For the above reasons, Claim 15 further patentably distinguishes over the references.

Furthermore, Claim 17 recites that the specified trip function is overridden by substituting the maintenance trip function for the specified trip function, which is retained for restoring following maintenance. Here, the Examiner relies upon the rejection of Claim 1 and argues: (1) "adjusting adjustment knobs ... from a higher setting to a lower setting"; (2) "[a]djustment knobs ... retain the parameter values of the higher settings associated with the specified trip function"; and (3) "these would be restored following maintenance, as normal operation requires higher settings".

Fitts et al. does not teach or suggest any method for providing protection against arc flash during maintenance, much less any overriding a specified trip function with a maintenance trip function that results in reduced arc energy in a fault during a trip over arc energy during a trip with a specified trip function. Papallo et al., which expressly teaches that main-1 CB 415 employs one delay when it trips to clear a fault (above Main Bus in Figure 7) and employs "additional delay" before main-1 CB 415 trips to clear another fault (below Feeder 2 CB 425 in Figure 6), clearly does not teach or suggest and, in fact, teaches away from "adjusting adjustment knobs ... from a higher setting to a lower setting" as part of a reduced arc energy maintenance trip function within the context of the claims and/or as argued by the Examiner. Hence, the references do not teach or suggest a specified trip function being overridden by substituting the recited maintenance trip function for such specified trip function. Furthermore, the references, which do not teach or suggest any reduced arc energy maintenance trip function, clearly do not teach or suggest retaining a specified trip function for restoring following maintenance. In addition, there is no teaching in the references, whether taken alone or in combination, that any adjustment knob be employed to retain or restore any parameter value in combination with maintenance within the context of the claims. Therefore, it is submitted that Claim 17 further patentably distinguishes over the references.

Claim 18 is an independent claim which recites, *inter alia*, a low voltage circuit breaker protecting from arc flash resulting from faults in a protected low voltage power circuit comprising separable contacts; current sensors sensing current in the protected low voltage power circuit; a trip unit responsive to the current sensors tripping open the separable contacts in response to a specified trip function; and maintenance means overriding the specified trip function with a maintenance trip function that results in reduced arc energy in the fault during a trip over arc energy during a trip with the specified trip function.

Fitts et al. does not teach or suggest a circuit breaker protecting from arc flash resulting from faults in a protected low voltage power circuit in combination with maintenance means overriding a specified trip function with a maintenance trip function that results in reduced arc energy in a fault during a trip over arc energy during a trip with such specified trip function.

Papallo et al., which expressly teaches that main-1 CB 415 employs one delay when it trips to clear a fault (above Main Bus in Figure 7) and employs "additional delay" before main-1 CB 415 trips to clear another fault (below Feeder 2 CB 425 in Figure 6), clearly does not teach or suggest and, in fact, teaches away from overriding a specified trip function with a ***maintenance*** trip function that results in ***reduced*** arc energy in a fault during a trip with such specified trip function.

As to "the minimal delay of the main-1 CB opening reduc[ing] the let-thru energy" from Papallo et al. (¶80, col. 7), the express teaching of Papallo et al. is that the next upstream circuit breaker will attempt to clear the fault with minimal additional delay based upon its modified dynamic delay time. If anything, this teaches and suggests increased arc energy in a fault during a trip over arc energy during a trip with a specified trip function. This is because the protection system 26 of Papallo et al. causes the circuit breaker 14 nearest to the fault to attempt to clear the fault and, thus, increases the delay time for opening of the upstream circuit breaker 14 to provide backup protection (at a later time) for the downstream circuit breaker nearest the fault.

Hence, for the above reasons, Claim 18 patentably distinguishes over the cited references.

It is submitted that another reason why Claim 18 is patentable over the references is that the circuit breaker reduces the likelihood that maintenance personnel might be seriously injured or killed from an arc flash. For example, U.S. Patent No. 6,777,627 (Stevenson), which was cited by the Examiner, states (col. 1, ll. 16-19; col. 2, ll. 7-9) that "[i]t is well known in the power distribution industry that personnel who work on or near

energized electrical equipment can be seriously injured or killed as a result of arcing faults" and that a "worker [being] well within the arc-flash danger zone ... could be seriously injured or killed in the event of an arc fault." Also, U.S. Patent No. 5,933,308 (Garzon), which was also cited by the Examiner, states (col. 1, ll. 34-37) that the "ionized gas associated with arcing faults may be released at pressures and temperatures sufficient to severely damage or destroy the switchgear equipment and/or cause severe burning injuries or death to operating personnel." Hence, it is respectfully submitted, *arguendo,* that if Applicants' invention was obvious, then in view of the very real and substantial desire to avoid serious or severe injury or death, surely someone would have disclosed Applicants' invention. This is not the case since no reference of record, whether taken alone or in combination, teaches or suggests Applicants' invention.

Therefore, for the above additional reasons, Claim 18 patentably distinguishes over the cited references.

Claims 19, 20 and 26 depend directly or indirectly from Claim 18, include all of the limitations thereof, and patentably distinguish over the references for at least the same reasons.

Furthermore, Claim 19 recites that the maintenance means comprises a maintenance switch operative between a normal position selecting the specified trip function, and a maintenance position selecting the maintenance trip function. Fitts et al. does not teach or suggest any circuit breaker providing protection against arc flash during maintenance, much less any ***reduced*** arc energy ***maintenance trip function***. Papallo et al., which expressly teaches that main-1 CB 415 employs one delay when it trips to clear a fault (above Main Bus in Figure 7) and employs "additional delay" before main-1 CB 415 trips to clear another fault (below Feeder 2 CB 425 in Figure 6), clearly does not teach or suggest and, in fact, teaches away from any maintenance means comprising a maintenance switch operative between a normal position selecting a specified trip function, and a maintenance position selecting a maintenance trip function that results in reduced arc energy in a fault during a trip over arc energy during a trip with a specified trip function. Applicants traverse the Examiner's statement that a maintenance switch within the context of Claim 19 is "well known". The Examiner is requested to cite a reference within the refined context of Claim 19. Accordingly, Claim 19 further patentably distinguishes over the references.

Claim 20 further patentably distinguishes over the references for similar reasons as discussed above in connection with Claim 11.

Claim 26 further patentably distinguishes over the references for similar reasons as discussed above in connection with Claim 15.

Claim 27 is an independent claim which recites, *inter alia*, a low voltage circuit breaker protecting from arc flash resulting from faults in a protected low voltage power circuit, the low voltage circuit breaker comprises: separable contacts; current sensors structured to sense current in the protected low voltage power circuit; a trip unit responsive to the current sensors, the trip unit structured to trip open the separable contacts in response to a specified trip function; and a maintenance mechanism structured to override the specified trip function with a maintenance trip function that results in reduced arc energy in the fault during a trip over arc energy during a trip with the specified trip function.

Fitts et al. does not teach or suggest a circuit breaker protecting from arc flash resulting from faults in a protected low voltage power circuit in combination with a maintenance mechanism structured to override a specified trip function with a maintenance trip function that results in reduced arc energy in a fault during a trip over arc energy during a trip with such specified trip function.

Papallo et al., which expressly teaches that main-1 CB 415 employs one delay when it trips to clear a fault (above Main Bus in Figure 7) and employs "additional delay" before main-1 CB 415 trips to clear another fault (below Feeder 2 CB 425 in Figure 6), clearly does not teach or suggest and, in fact, teaches away from overriding a specified trip function with a ***maintenance*** trip function that results in ***reduced*** arc energy in a fault during a trip with such specified trip function.

As to "the minimal delay of the main-1 CB opening reduc[ing] the let-thru energy" from Papallo et al. (¶80, col. 7), the express teaching of Papallo et al. is that the next upstream circuit breaker will attempt to clear the fault with minimal additional delay based upon its modified dynamic delay time. If anything, this teaches and suggests increased arc energy in a fault during a trip over arc energy during a trip with a specified trip function. This is because the protection system 26 of Papallo et al. causes the circuit breaker 14 nearest to the fault to attempt to clear the fault and, thus, increases the delay time for opening of the upstream circuit breaker 14 to provide backup protection (at a later time) for the downstream circuit breaker nearest the fault.

Accordingly, for the above reasons, Claim 27 patentably distinguishes over the cited references.

It is submitted that another reason why Claim 27 is patentable over the references is that the circuit breaker reduces the likelihood that maintenance personnel might

be seriously injured or killed from an arc flash. For example, U.S. Patent No. 6,777,627 (Stevenson), which was cited by the Examiner, states (col. 1, ll. 16-19; col. 2, ll. 7-9) that "[i]t is well known in the power distribution industry that personnel who work on or near energized electrical equipment can be seriously injured or killed as a result of arcing faults" and that a "worker [being] well within the arc-flash danger zone ... could be seriously injured or killed in the event of an arc fault." Also, U.S. Patent No. 5,933,308 (Garzon), which was also cited by the Examiner, states (col. 1, ll. 34-37) that the "ionized gas associated with arcing faults may be released at pressures and temperatures sufficient to severely damage or destroy the switchgear equipment and/or cause severe burning injuries or death to operating personnel." Hence, it is respectfully submitted, *arguendo,* that if Applicants' invention was obvious, then in view of the very real and substantial desire to avoid serious or severe injury or death, surely someone would have disclosed Applicants' invention. This is not the case since no reference of record, whether taken alone or in combination, teaches or suggests Applicants' invention.

Therefore, for the above additional reasons, Claim 27 patentably distinguishes over the cited references.

Claims 28 and 29 depend directly or indirectly from Claim 27, include all of the limitations thereof, and patentably distinguish over the references for at least the same reasons.

Furthermore, Claim 29 further patentably distinguishes over the references for similar reasons as discussed above in connection with Claim 19.

The Examiner rejects Claim 13 on the ground of being unpatentable over Fitts et al. in view of Papallo et al. and further in view of Japanese Patent JP411155235A (Iriyama).

The English language Abstract of Iriyama discloses a circuit breaker including a reverse current detecting circuit, in order to detect "reverse current or reverse power flowing through a cable 3".

It is submitted that Iriyama adds nothing to Fitts et al. and Papallo et al. to render Claim 1 unpatentable. In particular, Iriyama does not teach or suggest overriding a specified trip function with a maintenance trip function that results in reduced arc energy in a fault during a trip over arc energy during a trip with such specified trip function, or restoring such specified trip function following maintenance.

Claim 13 depends from Claim 1, includes all of the limitations thereof, and patentably distinguishes over the references for at least the same reasons.

Claim 13 recites that the recited maintenance trip function of Claim 1 also causes a trip in response to a current reversal in the low voltage circuit. Fitts et al. does not teach or suggest any method for providing protection against arc flash during maintenance, much less any ***reduced*** arc energy ***maintenance trip function***. Papallo et al., which expressly teaches that main-1 CB 415 employs one delay when it trips to clear a fault (above Main Bus in Figure 7) and employs "additional delay" before main-1 CB 415 trips to clear another fault (below Feeder 2 CB 425 in Figure 6), clearly does not teach or suggest and, in fact, teaches away from the recited maintenance trip function of Claim 1 that results in reduced arc energy in a fault during a trip over arc energy during a trip with a specified trip function. Since Iriyama does not teach or suggest overriding a specified trip function with a maintenance trip function that results in reduced arc energy in a fault during a trip over arc energy during a trip with such specified trip function, it does not teach or suggest such a recited maintenance trip function that also causes a trip in response to current reversal in a low voltage circuit. Hence, Claim 13 further distinguishes over the references.

Allowable Subject Matter

The Examiner states that Claims 16 and 21-25 would be allowable if rewritten in independent form to include all of the limitations of the base claim and any intervening claims.

Claim 16 has been rewritten in independent form including the limitations of Claim 1. Accordingly, it is submitted that Claim 16 is in proper form for allowance.

Claim 21 has been rewritten in independent form including the limitations of Claim 18. Accordingly, it is submitted that Claim 21 is in proper form for allowance.

Claims 22-25 depend directly or indirectly from Claim 21. Accordingly, it is submitted that Claims 22-25 are in proper form for allowance.

Summary and Conclusion

The prior art made of record and not relied upon but considered pertinent to Applicants' disclosure has been reviewed. In summary, it is submitted that Claims 1-29 are patentable over the references of record.

Reconsideration and early allowance are requested.

Respectfully submitted,

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